O&G Section	Mitigation Option	Written (Y/N)	If No, Rationale
Oil and Gas: Overarching Issues	Lease and permit incentives for improving air quality on public lands	Y	
	Economic-Incentives Based Emission Trading System (EBETS)	Y	
	Tax or Economic Development Incentives for Environmental Mitigation	Y	
	Voluntary Partnerships and Pay-back Incentives: Four Corners Innovation Technology and Best Energy-Environment Management Practices (IBEMP)	Y	
Oil and Gas: Turbines	Upgrade Existing Turbines to Improved Combustion Controls (Emulating Dry LoNOx Technology) where feasible	Y	
Oil and Gas: Stationary RICE (Small and large engines)	Industry Collaboration (new title)	Y	
	Install Electric Compression	Y	*See Also Power Plants-Overarching/Crossover*
	Optimization/Centralization	Y	
	Follow EPA New Source Performance Standards (NSPS)	Y	
	Adherence to Manufacturers' Operation and Maintenance Requirements	Y	
	Use of SCR for NOx control on lean burn engines	Y	
	Use of NSCR / 3-way Catalysts and Air/Fuel Ratio Controllers on Stoiciometric Engines	Y	
	Use of Oxidation Catalysts and Air/Fuel Ratio Controllers on Lean Burn Engines	Y	
	Install Lean Burn Engines	Y	
	Interim Emissions Recommendations for Stationary RICE	Y	
	Emission limit on existing engines (1g/hp hr and 2g/hp hr)	N	Will highlight the emissions reductions in the other mitigation option drafts but will not be treated as a separate category. Depending upon the draft mitigation options, this item may remain separate but this will be determined later.

O&G Section	Mitigation Option	Written (Y/N)	If No, Rationale
	Replacing ignition systems to decrease false starts	N	This option is generally covered in the Operation and Maintenance mitigation option. *See Adherence to Manufacturers' Operation and Maintenance Requirements above.* Insignificant air quality benefit.
	Replace piston rod packing (pumps)	N	This was deleted as a separate item and instead will be included with O&M section; however it wasn't included in this section
	Minimize (control?) engine blow downs	N	This was deleted by the drafting team since it is not an emission control technology
	Utilize exhaust gas analyzers to adjust AFR	N	This was included in the Oxidation Catalysts and AFRC on Lean Burn Engines option.
	Smart AFRC (air-fuel-ratio-controller)	N	Included in the other AFRC options
	Replace gas engine starters with electric air compressors	N	This was deleted by the drafting team since it is not an engine emission control technology
	Provide training for field personnel on engine maintenance with regard to AQ considerations	N	Jen: Part of another paper? NO- still needs to be written or rationale for not doing so determined
Oil and Gas: Rig Engines	Diesel Fuel Emulsions	Y	
	Natural Gas Fired Rig Engines	Y	
	Selective Catalytic Reduction (SCR)	Y	
	Selective Non-Catalytic Reduction (SNCR)	Y	
	Implementation of EPA's Non Road Diesel Engine Rule – Tier 2 through Tier 4 standards	Y	
	Interim Emissions Recommendations for Drill Rigs	Y	

O&G Section	Mitigation Option	Written (Y/N)	If No, Rationale
	Analysis of all drill rigs – replace the dirtiest 20%	N	Will reference in Tier 2-4 Mitigation Option Development, but also move to overarching discussion to determine the priority on rig engine reductions
	Electric powered drill rig	N	Not selected by the drafting team due to low feasibility around availability of electricity
	Various Diesel Controls, including: Duel fuel (or Bi-fuel) diesel and natural gas Bio diesel PM Traps Free gas recirculation Fuel Additives Liquid Combustion Catalyst Lean NOx Catalyst Low NOx ECM Exhaust Gas Recirculation (EGR)	Y	These are all combined into the Diesel Control paper – *cross over to Other Sources?*
Oil and Gas: Mobile and Non-Road	Fugitive dust control plans for dirt/gavel road and land clearing	Y	*See also Other Sources- Fugitive Dust Mitigation Plan (Coming Soon)*
	Use produced water for dust reduction	Y	
	Pave roads to mitigate dust	Y	
	Automation of wells to reduce truck traffic	Y	*See also Optimization and Automation in E&P Dehydrators Below*
	Reduced Vehicular Dust Production by Enforcing Speed Limits	Y	*Crossover to Other Sources- Phased Construction / Operations?*
	Reduced Truck Traffic by Centralizing Produced Water Storage Facilities	Y	
	Reduced Vehicular Dust Production by Covering Lease Roads with Rock or Gravel	Y	
	Reduced Truck Traffic by Efficiently Routing Produced Water Disposal Trucks	Y	
	Use Alternative Fuels and Maximize Fuel Efficiency to Control Combustion Engine Emissions	Y	
	Utilize Exhaust Emission Control Devices for Combustion Engine Emission Controls	Y	
	Exhaust Engine Testing for Combustion Engine Emission Controls	Y	

O&G Section	Mitigation Option	Written (Y/N)	If No, Rationale
	Reduce Trucking Traffic in the Four Corners Region	Y	*Tagged for Cum/Effects Group*
Oil and Gas: E&P Tanks	BMP: close hatches, maintain seals, enardo valves	In/Email to Jen	Kellie Skelton completed – get into Version 5; circulate to workgroup
	Install VRU	In	Bruce Gantner ditto
	Inert Gas Blanket	In	Bruce Gantner ditto
	Install Flares	On Hold	Myke Lane is researching viability, don't have much flash at E&P sites, more viable at CS and GP [David Bays will check]
	Floating Roof Tanks	In/email to Jen	Kellie Skelton done – email to workgroup
	Mufflers	N	Does not apply to AQ
	Centralized Collection for Existing Sources	N	Not feasible for retrofit in SJB
	Centralized Collection for New Sources	Y	Walt will write for new development, Christi asst.
Oil and Gas: E&P Dehydrators/ Separators/ Heaters	Control glycol pump rates	Y	Dave Brown will write
	Replace high bleed pneumatics w/ low bleed pneumatics	Coming	Myke Lane…David Bays will check – see if Myke wants to add to Bill H's paper on air actuated below
	Optimization and automation	Coming	D Brown: add in something on this in paper above *See also Automation of wells to reduce truck traffic in Mobile and Nonroad above*
	Low/Ultra low NOx burners	Coming	Brit Benko D Brown will check
	"Quantum Leap" dehy units	Y	
	Insulated Vessels	Coming	Bruce Gantner
	Combustors for still vents	Coming	Dave Brown
	VRU	Coming	Dave Brown

O&G Section	Mitigation Option	Written (Y/N)	If No, Rationale
	Desiccant Dehys	Y	
	Centralized Dehys	N	Already or will be incorporated in other papers on centralization (Jen will check)
Oil and Gas: E&P Wells	Flareless Completions (Green Completions)	Y	
	Plunger Lifts	Coming	Dave Brown
	Plunger optimization	Coming	Dave Brown – combined w/ above
	Comparing/trade-offs between flaring and venting	Yes	
Oil and Gas: E&P Pneumatics/ Controllers/ Fugitives	Air actuated pneumatics	Y	Bill Hochheiser [Does Myke want to add something from this to replacing high bleed pneumatics?]
	Optical imaging to detect leaks	Y	
	Electrification of starters and valves	?	Off GasStar site? Jen/Andy check
	Directed inspection and maintenance program	?	Check to combine with optical imaging – Jen/Andy
	Electric Chemical pumps	coming	Bruce Gantner